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Crowdsourcing and stigmergic approaches for (swarm) intelligent transportation systems

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Abstract

© Springer International Publishing AG 2018. In the last decades, the impact of Information and Communication Technologies (ICT) on transportation systems radically changed them, identifying in the Intelligent Transportation Systems (ITS) a new research area. A problem often addressed in ITS is vehicle routing, for which plenty of solutions have been already defined in literature. Vehicle routing problems are usually NP hard, therefore these are mainly heuristic solutions. A requirement for them is to be deployed and run in navigation systems, ready to react to sudden changes in a (quasi) real-time way. Hence, to reduce the latency is still an open issue, not only depending on the complexity of the solution but also on other parameters, such as the traffic update latency in traffic-aware vehicle routing. A way to solve them is by exploiting distributed, collaborative approaches, establishing a proper collaboration platform and algorithms able to use it. Mobile Crowdsensing, on the one hand, and collective and swarm intelligence approaches, on the other, can fill this gap. This paper is a first attempt in this direction, aiming at defining a new class of (swarm) the Intelligent Transportation Systems (SITS), on top of a crowdsourcing-based infrastructure.

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Keywords

ITS, MANETs, Mobile crowdsensing, Stigmergy, Traffic engineering

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